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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------|------------------------|
| 10/534,962 | 05/16/2005 | Masayoshi Kondo | 033036.088 | 1696 |
| 25461 7590 09/07/2007 SMITH, GAMBRELL & RUSSELL SUITE 3100, PROMENADE II 1230 PEACHTREE STREET, N.E. ATLANTA, GA 30309-3592 | | | EXAMINER PATEL, ISHWARBHAI B | |
| | | | ART UNIT 2841 | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|---|-------------------------------------|--|
| Office Action Summary | Application No. 10/534,962 | Applicant(s) KONDO ET AL. | |
| | Examiner Ishwar (I. B.) Patel | Art Unit 2841 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
 4a) Of the above claim(s) 1-16 and 21-32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>5/16/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group I, sub-specie B2, claims 17-20 in the reply filed on July 25, 2007 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 1-16 and

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been received and placed of record in the file.

Claim Objections

3. Claims 17-20 are objected to because of the following informalities:
Regarding claim 17, "the multilayer portion," line 9, lacks antecedent basis.
Claims 18-20 depend upon claim 17 and inherit the same deficiency.
Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (US Patent No. 6,570,098) in view of Dixon (US Patent No. 4,800,461).

Regarding claim 17, Shimizu in figure 13 discloses a multilayer wiring board comprising (i) plural single-sided wiring boards (3, 4, 5, 6, figure 2) having a wiring pattern formed on one side of a substrate made of an insulating material and two-layer conductor posts made of copper and a metal (shown in figure 4, copper with nickel plating), each said conductor post projecting from said wiring pattern to the side of said substrate opposite from said wiring pattern (see figure 2), with the substrates other than that of the outermost layer having, on the side opposite from said conductor posts, the pads for making connection to the conductor posts, and said wiring pattern having no surface coating (see figure), (ii) a wiring board (51) having on at least one side thereof the pads for connection to said conductor posts and comprising a wiring pattern (see figure 2, element 2 is equivalent to element 51 of figure 13)), and (iii) an adhesive layer (7) whereby the respective boards are laminated integrally, wherein said conductor posts and pads are connected by a metal or an alloy through the medium of said adhesive layer, and said wiring patterns are electrically connected (see figure 2 and 13).

Shimizu does not disclose the wiring board as a flexible board, surface the coating applied on the flexible portion but no surface coating applied on the multilayer portion and the adhesive having flux function. Middle portion (51) of Shimizu is rigid.

However, the board with flexible middle portion with coating on the flexible portion for protection are old and known in the art facilitating the flexibility during operation.

Dixon in figure 3 discloses a circuit board with a flexible portion with an insulating coating (20) in the flexible portion.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Shimuzu with the middle part (51) made of a flexible substrate with the coating on the flexible portion, as taught by Dixon, in order to have the flexibility during operation or mounting.

Regarding the limitation, the adhesive having flux function, it is old and known in the art to use adhesive with flux function for better connection strength. Pennisi discloses an adhesive (120) with fluxing function to promote adhesion (column 3, line 5-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the board of Shimuzu with the adhesive having the flux function, as taught by Pennisi, in order to have better connection strength.

Regarding claim 18, Shimuzu further discloses said flexible wiring board is a severed individual piece (as the board of Shimuzu is an individual piece).

Regarding claim 19, Shimuzu further discloses the metal is nickel (column 4, line 61).

6. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over the modified board of Shimizu as applied to claim 17 above, and further in view of Nakamura (US Patent No. 6,395,993).

Regarding claim 20, Shimuzu discloses all the features of the claimed invention as applied to claim 17 above but does not disclose the alloy comprises at least two of tin, lead, silver, zinc, bismuth, antimony and copper. Shimuzu discloses a metal, nickel with gold. However, use of alloy on the bump is old and known in the art for getting desired bonding strength. Nakamura discloses a board with a solder coating made of tin/zink (36) on the bump (figure 30) and further recites that low melting metals such as copper, nickel, copper-nickel alloys and alloy based on tin and gold may also be used.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to provide the modified board of Shimuzu with the alloy comprises at least two of tin, lead, silver, zinc, bismuth, antimony and copper, as taught by Nakamura, in order to have desired bonding properties.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

J. M. Shaheen (US Patent No. 3,471,348) discloses a multilayer board with flexible portion.


Enomoto (US Patent No. 6,586,686) in figure 1 discloses a multilayer board with bump (38c,d) made up of solder or indium alloy (column 6, line 12).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
September 3, 2007


Ishwar (I. B.) Patel
Primary Examiner
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